



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
[www.uspto.gov](http://www.uspto.gov)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/646,551	08/21/2003	Zhibo Zhao	DP-308065	9433
7590 SCOTT A. MCBAIN DELPHI TECHNOLOGIES, INC. Mail Code: 480-410-202 P.O. Box 5052 Troy, MI 48007-5052		02/09/2007	EXAMINER NGUYEN, DINH Q	
			ART UNIT 3752	PAPER NUMBER
SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE		
2 MONTHS	02/09/2007	PAPER		

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.



UNITED STATES PATENT AND TRADEMARK OFFICE

---

Commissioner for Patents  
United States Patent and Trademark Office  
P.O. Box 1450  
Alexandria, VA 22313-1450  
[www.uspto.gov](http://www.uspto.gov)

**MAILED**

**FEB 09 2007**

**Group 3700**

**BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES**

Application Number: 10/646,551

Filing Date: August 21, 2003

Appellant(s): ZHAO ET AL.

---

Trent K. English  
For Appellant

**EXAMINER'S ANSWER**

This is in response to the appeal brief filed October 19, 2006 appealing from the Office action mailed July 26, 2006.

**(2) Related Appeals and Interferences**

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

**(3) Status of Claims**

The statement of the status of claims contained in the brief is correct.

**(4) Status of Amendments After Final**

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

**(5) Summary of Claimed Subject Matter**

The summary of claimed subject matter contained in the brief is correct.

**(6) Grounds of Rejection to be Reviewed on Appeal**

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

**WITHDRAWN REJECTIONS**

The following grounds of rejection are not presented for review on appeal because they have been withdrawn by the examiner.

Claims 1-3, 5-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Van Steenkiste et al (U.S. Patent No. 6,139,913) or Popoola et al (U.S. Patent No. 6,464,933).

**(7) Claims Appendix**

The copy of the appealed claims contained in the Appendix to the brief is correct.

**(8) Evidence Relied Upon**

3,645,298	ROBERTS et al	2-1972
4,740,408	MOCHIDA et al	4-1988
5,932,293	BELASHCHENKO et al	8-1999
6,139,913	VAN STEENKISTE et al	10-2000
6,464,933	POPOOLA et al	10-2002

**(9) Grounds of Rejection**

The following ground(s) of rejection are applicable to the appealed claims:

***Claim Rejections - 35 USC § 103***

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-3, 5-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Van Steenkiste et al (U.S. Patent No. 6,139,913) or Popoola et al (U.S. Patent No. 6,464,933) in view of Roberts et al.

With respect to claims 1, 3, 5 and 7, Van Steenkiste et al. or Popoola et al. teaches all the limitations of the claims except for gas flow holes with hydraulic diameter of 0.5 to 5.0 millimeters and a length from 10-30 millimeters. However, Roberts discloses a collimator having flow holes with hydraulic diameter of 0.5 millimeters and a length such that can be selected (column 2, lines 37+). Therefore, it would have been obvious to one having ordinary skill in the art to have provided the device of Van

Steenkiste et al. or Popoola et al. with a hydraulic diameter of 0.5 to 5.0 millimeters and a length from 10-30 millimeters as suggested by Roberts. Doing so would provide a way to control flow (see column 1, lines 22+).

3. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Van Steenkiste et al. or Popoola et al. or in view of Roberts et al. as applied to claims 1-3, 5-10 above, and further in view of Mochida.

Van Steenkiste et al. or Popoola et al. or in view of Roberts et al. teaches all the limitations of the claims except for hexagonal shape gas flow holes. However, Mochida discloses gas flow holes of hexagonal shape (figure 3B). Therefore, it would have been obvious to one having ordinary skill in the art to have provided the device of Van Steenkiste et al. or Popoola et al. or in view of Roberts et al. with hexagonal shape gas flow holes as suggested by Mochida. Doing so would provide a selected pressure drop (see column 2, lines 38-57).

4. Claim 11-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Van Steenkiste et al. or Popoola et al. or in view of Roberts et al. as applied to claims 1-3, 5-10 above, and further in view of Belashchenko et al.

Van Steenkiste et al. or Popoola et al. or in view of Roberts et al. teaches all the limitations of the claims except for an injector tube extending through the throat. However, Belashchenko et al discloses a spraying system with an injector tube 68 that extends to the throat. Therefore, it would have been obvious to one having ordinary skill in the art to have provided the device of Van Steenkiste et al. or Popoola et al. or in view of Roberts et al. with the injector tube extending through the throat as suggested

Art Unit: 3752

by Belashchenko. Doing so would provide a way to introduce material into a high velocity flow stream of gas (see column 11, lines 34-55).

With respect to claims 12-16, at the time the invention was made, it would have been an obvious matter of design choice to a person of ordinary skill in the art to provide different configurations or location of the injector tube, or with different flow rate for the injector tube.

#### **(10) Response to Argument**

The Amendment filed on April 24, 2006 under 37 CFR 1.131 has been considered but is ineffective to overcome the rejections dated January 23, 2006. Van Steenkiste et al. or Popoola et al. reference discloses a gas collimator with a central hole and a plurality of gas flow holes, Van Steenkiste et al. or Popoola et al. does not specify on the ranges of the length and the hydraulic diameter or gas flow holes. It would have been obvious to one having ordinary skill in the art at the time the invention was made to employ such ranges for the length and the hydraulic diameter or gas flow holes, since discovering the optimum or workable range involves only routine skill in the art. Furthermore, the Roberts reference specifying the collimator having a plurality of gas holes with hydraulic diameter of 0.5 millimeters and a selected length as stated in column 2, lines 37+, the Roberts reference also stated that the aspect ratio of a length to a cross section diameter can be selected to maintain the required pressure drop for gas passing through the collimator, it is well known in the art that the less pressure in a flow, the more the uniform flow will be. Therefore, the Van Steenkiste et al. or Popoola

Art Unit: 3752

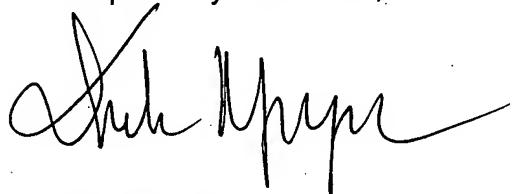
et al. gas collimator in view of the Roberts teaching a way to maintain a more uniform flow with less turbulence.

**(11) Related Proceeding(s) Appendix**

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,



Dinh Nguyen

Conferees:

Kevin Shaver



Eric Keasel

